

What is claimed is:

- Sub A
1. An optical fiber comprising:
a core doped with active species,
an inner cladding surrounding the core,
an outer cladding surrounding the inner cladding,
wherein the cross-sectional shape of said inner cladding is an asymmetric and symmetry-broken polygon that destabilizes local modes of light beams within said inner cladding, and wherein at least one boundary of the boundaries forming said polygon shape is an arc.
2. An article for gain applications comprising
at least one laser diode array,
a double cladding laser fiber with its core doped with active species, said double cladding laser fiber has an inner cladding and an outer cladding,
a coupling optical system,
wherein said coupling optical system is disposed between said diode laser array and the aperture of said fiber and focuses the beam from said diode laser pumping source into the inner cladding of said double cladding laser fiber, and wherein the cross-sectional shape of said inner cladding is an asymmetric and symmetry-broken polygon that destabilize local modes of light beams within said inner cladding.
- Sub B
3. An apparatus of claim 2, wherein at least one boundary of the boundaries forming said polygon shape is an arc.
4. An apparatus of claim 2, wherein said symmetry-broken cladding is a symmetry-broken rectangular cladding.
5. An apparatus of claim 2, wherein the cross-sectional shape of said inner cladding is a multiple-imaging cladding.

6. An apparatus of claim 6, wherein said multiple-imaging cladding is rectangular-like multiple-imaging cladding.

7. An apparatus of claim 2, wherein said article for gain applications is a fiber laser by further including reflector means disposed at both ends of said double cladding fiber.

8. An apparatus of claim 2, wherein said article for gain application is an optical amplifier by further including means coupling signals into the core of the said double cladding fiber.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.